

Date: Wed, 21 Jul 93 03:30:18 PDT  
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>  
Errors-To: Info-Hams-Errors@UCSD.Edu  
Reply-To: Info-Hams@UCSD.Edu  
Precedence: Bulk  
Subject: Info-Hams Digest V93 #884  
To: Info-Hams

Info-Hams Digest                      Wed, 21 Jul 93                      Volume 93 : Issue 884

Today's Topics:

                                    Broadcasting...  
                    BULLETIN: Service Interruption Notice  
            Daily Solar Geophysical Data Broadcast for 20 July  
                                    hamfest  
How to find the answers to frequently-asked questions about Ham Radio  
                                    IC-735 AGC pumping  
                                    Intermodulation  
            Popular Electronics advertises perpetual-motion machine.  
                                    TS50

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>  
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

-----  
Date: Wed, 21 Jul 93 06:44:17 GMT  
From: mercury.hsi.com!a3bee2!cyphyn!randy@uunet.uu.net  
Subject: Broadcasting...  
To: info-hams@ucsd.edu

acm139@ccs.northeastern.edu (Scott Ehrlich) writes:  
: To the person who mentioned broadcasting is illegal:  
:  
: 1) W1AW does it;  
:  
: 2) There is "Beaconing" which could be considered a broadcast.  
:  
:  
: =====

## SCHEDULED SERVICE OUTAGE IN-PROGRESS

Many services are being temporarily suspended between 21 July and 28 July 1993. These services include: all distribution services (e-mail products), and mirrored distribution products (e-mail) stored for FTP. Other services such as solar imagery FTP services, and the 3-hourly updated indices service, should remain operational, but may need to be taken temporarily off-line without warning.

All services are scheduled to resume normal operation on 29 or 30 July. All missed e-mail products will be distributed on these days.

We apologize for any inconvenience this may cause, and thank you all for your patience.

\*\* End of Bulletin \*\*

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Date: 21 Jul 93 08:30:26 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: Daily Solar Geophysical Data Broadcast for 20 July  
To: info-hams@ucsd.edu

NOTE: WE WILL BE SUSPENDING MANY SERVICES (INCLUDING THESE DAILY REPORTS) UNTIL NEXT THURSDAY, JULY 29. THIS IS A SCHEDULED SERVICE OUTAGE. SERVICES WILL RESUME AND OLD REPORTS WILL BE DISTRIBUTED ON 29 OR 30 JULY. WE APOLOGIZE FOR ANY INCONVENIENCE THIS MAY CAUSE AND THANK YOU FOR YOUR PATIENCE.

!!BEGIN!! (1.0) S.T.D. Solar Geophysical Data Broadcast for DAY 201, 07/20/93  
10.7 FLUX=102.2 90-AVG=108 SSN=094 BKI=1234 2233 BAI=012  
BGND-XRAY=B1.5 FLU1=8.5E+05 FLU10=1.2E+04 PKI=1234 2344 PAI=015  
BOU-DEV=008,018,024,042,019,017,025,038 DEV-AVG=023 NT SWF=00:000  
XRAY-MAX= C1.0 @ 0258UT XRAY-MIN= B1.1 @ 0207UT XRAY-AVG= B2.4  
NEUTN-MAX= +004% @ 0130UT NEUTN-MIN= -002% @ 2110UT NEUTN-AVG= +0.3%  
PCA-MAX= +0.5DB @ 1540UT PCA-MIN= -0.9DB @ 2305UT PCA-AVG= +0.1DB  
BOUTF-MAX=55383NT @ 1422UT BOUTF-MIN=55322NT @ 1756UT BOUTF-AVG=55365NT  
GOES7-MAX=P:+000NT@ 0000UT GOES7-MIN=N:+000NT@ 0000UT G7-AVG=+072,+000,+000  
GOES6-MAX=P:+134NT@ 1810UT GOES6-MIN=N:-084NT@ 2224UT G6-AVG=+093,-019,-052  
FLUXFCST=STD:110,110,110;SESC:110,110,110 BAI/PAI-FCST=020,020,010/020,015,010  
KFCST=3345 2344 4434 5233 27DAY-AP=013,025 27DAY-KP=3213 3243 3454 4433  
WARNINGS=  
ALERTS=\*\*SWEEP:II=1@0256-0306UTC  
!!END-DATA!!

NOTE: The Effective Sunspot Number for 19 JUL 93 was 78.0.  
The Full Kp Indices for 19 JUL 93 are: 2- 2- 1- 2- 1o 1+ 2o 2o

-----  
Date: 21 Jul 93 00:11:13 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: hamfest  
To: info-hams@ucsd.edu

(FORMERLY THE WABASH VALLEY HAMFEST)  
Sponsored by The Wabash Valley Amateur Radio Association, Inc.

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SATURDAY, OCTOBER 2, 1993  
7 AM to 4 PM  
Clay County 4-H Fairgrounds  
2-1/2 Miles North of I-70 on Ind 59 in Brazil, Indiana  
(Rain or Shine) This is an INDOOR hamfest in a spacious facility.

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Tickets are \$5. Advanced ticket sales are in effect until August 15, 1993.

There will be a special drawing for holders of advanced sale tickets.  
The prize will be FIFTY DOLLARS. For advanced tickets send check to:

Tickets  
WVARA Hamfest  
P.O. Box 81  
Terre haute, IN 47808

-----  
CASH DOOR PRIZE!                      HOURLY PRIZES  
FREE BINGO                              2-M TRANSMITTER HUNTS  
INDOOR FLEA MARKET                    BREAKFAST SERVED 7-10 AM  
VE TESTING SESSION 10 AM               LUNCH SERVED 11 - 2 PM

-----  
TALK IN: CALL W9UUU, 146.85 OR 444.35

-----  
VENDORS: Forty tables are available at \$5 each. Some tables will have  
120-V a-c power. Specify if you want electricity. Spots with electricity  
will be available on a first come, first served basis at no extra charge.  
All vendors must purchase a ticket.

For table space send your reservation stating the number of tables you want  
and a check for \$5 for each table to:

TABLES - WVARA HAMFEST  
BOB NELSON W08X  
RTE. 3, BOX 223  
PARIS, IL 61944

Bob's phone : 217-463-2213...(Eve); 217-465-2606 X-297...(Day)

-----  
VE TESTING SESSION: 10AM. All who come to be tested, must bring the following:  
(a) Your original current ham license, (b) a copy of the same,

(c) identification with your picture on it, (d) any Certificates of Successful Completion, (e) check for \$5.60 made out to ARRL VE.

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Date: 21 Jul 93 09:44:12 GMT

From: rtech!amdahl!amdahl!uts.amdahl.com@decwrl.dec.com

Subject: How to find the answers to frequently-asked questions about Ham Radio

To: info-hams@ucsd.edu

Posted-By: auto-faq 2.4

Archive-name: ham-faq-ptr

How to find the Rec.radio.amateur.misc Frequently Asked Questions list

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This article will tell you how to find the answers to frequently-asked Questions (FAQ) from rec.radio.amateur.misc. The FAQ articles are posted on the 7th of each month. This article is posted on the 14th, 21st, and 28th of every month as a reminder of where to find the FAQ.

The FAQ articles are intended to summarize some common questions on the rec.radio.amateur.misc newsgroup and Info-Hams mail list as well as to help beginners get started.

Besides the monthly posting, the FAQ is always available via anonymous FTP and from e-mail servers. This article contains instructions for obtaining a copy of the FAQ. It also contains the table of contents from the FAQ so that you know which questions are covered by it.

Please provide a copy of the FAQ to any new or soon-to-be Hams you know.

Regular FAQ postings can help save network bandwidth and maintain a good signal-to-noise ratio in the newsgroup. However, they can't do it alone - you, the reader, have to use them. If you are a new user, please print and review the FAQ articles and look at the instructions in the news.newusers newsgroup before posting any articles. If you are an experienced user, please help by refraining from answering frequently-asked questions on the newsgroup if they are already answered by the FAQ articles. Instead, send e-mail to the user who asked the question. (It will be helpful if you include the part of the FAQ that answers their question, but not the whole thing.)

--How to obtain a current copy of the FAQ-----

There are 3 ways to obtain a copy of the FAQ.

- 1) NetNews
- 2) Anonymous FTP

### 3) An Electronic Mail Server

#### Option #1: NetNews

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If you are familiar enough with NetNews to look through previous articles on your system, Option #1 above may be the easiest for you. The FAQ is posted so that it should not expire from your site's news spool until the next one is posted. Unfortunately, some news administrators do not honor the expiration dates meant to preserve the FAQ.

Look in rec.radio.amateur.misc, rec.radio.info, rec.answers, or news.answers. If the FAQ has expired at your site, try Option #2 (and ask your news administrator to honor expiration dates for articles cross-posted to news.answers if he/she can.)

#### Option #2: Anonymous FTP

-----

Anonymous FTP uses the File Transfer Protocol. It is only available to sites which are directly connected to the Internet. If you don't know how to use FTP and can't find a friend to help you, continue to Option #3. If your site is not connected to the Internet, you should also continue to Option #3.

The following sites have copies of the FAQ:

site name & address    path to FAQ articles

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ftp.amdahl.com	pub/radio/amateur/faq.[1-3].Z located in western USA, updated daily when changes occur
ftp.cs.buffalo.edu	pub/ham-radio/faq_ham_[1-3] located in eastern USA, updated monthly
rtfm.mit.edu	pub/usenet/news.answers/radio/ham-radio/faq/part* located in eastern USA, updated monthly contains news.answers archive - most UseNet FAQs are here
grivel.une.edu.au	pub/ham-radio/buffalo/ham-radio/faq_ham_[1-3] located in Australia, updated monthly (mirror of Buffalo)
nic.funet.fi	pub/ham/info/faq_ham_[1-3] located in Finland, updated monthly

Remember, when connecting to the remote system, use the login name of "anonymous" and, as a courtesy to the site administrators, your e-mail address for the password.

#### Option #3: Electronic Mail Server

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If you can't use Options 1 or 2, your only remaining option is electronic mail. You can retrieve a copy of the FAQ by sending a message to  
mail-server@rtfm.mit.edu

The body of your mail will contain a command for the mail server software.

To get all of the FAQ (consisting of 70K of e-mail in 3 parts), place the following in the first line of your message:

send usenet/news.answers/radio/ham-radio/faq/★

Leave out the subject of your message because the mail server will ignore it.

--- begin sample mail message ---

To: mail-server@rtfm.mit.edu

From: me@here.org

Date: Mon Aug 14 22:27:33 PDT 1995

send usenet/news.answers/radio/ham-radio/faq/★

--- end sample mail message ---

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Date: Tue, 20 Jul 1993 02:48:54 GMT  
From: usc!cs.utexas.edu!sdd.hp.com!hpscit.sc.hp.com!hplextra!hpfco!  
myers@network.ucsd.edu  
Subject: Intermodulation  
To: info-hams@ucsd.edu

> For an amplifier with nonlinear behaviour harmonics of these two tones  
> are generated and they are mixed by the nonlinearities in the amplifier.  
  
> This produces spurious signals that are related to the input tones.  
> These are the "intermodulation products". This is why a "two tone" test  
> is used to measure the performance of amplifiers (and mixers) -- it is  
> the simplest way to reproduce this behaviour.  
>  
>  $f(1) + f(2)$  we define not to be a problem as this is just linear mixer  
> (or it may even be a desired mixer product!). Similarly with  $f(1) - f(2)$ .

This isn't quite right; first of all, it is the nonlinearities of an amplifier that generate the harmonics, etc., in the first place, not just "mixing" them. A "mixer" is SUPPOSED to be a nonlinear circuit; you DO NOT get a component at  $f(1) + f(2)$  through any simple linear action. And a component at that frequency cannot simply be "defined" as a non-problem; it may most definitely be an undesired signal, and does in any event represent distortion since it is NOT present in the original input. (I'm talking from a linear amplifier perspective, here; certainly, in a mixer, you *want* these things to happen.

This may all be better understood by simply looking at the problem mathematically (don't run off, this'll be almost painless). An ideal amplifier would be perfectly linear, which means that its operation would be characterized by a simple linear equation, i.e.,

$$V_{out} = A \times V_{in}$$

where A is, of course, the amplifier gain (which can be fractional or negative - it doesn't matter, it's still the equation of a line). What you get out is an exact-but-scaled replica of what you put in.

But such a perfect amplifier is impossible; there is always some deviation from perfect linearity. Conceivably, you could describe the *real* operation by an equation of some order N, although N might have to get pretty high in order to do so. The simplest non-linear equation we can consider, though, will be useful to see the problem of non-linearity. Suppose we add a squared term, like this:

$$V_{out} = A V_{in}^2 + B V_{in}$$

Here, the "B" term is the linear one, the action we want - simple scaling of the input. The problems are all in the first part, the squared term. Even if the input is a sine wave, distortion is clearly occurring; and what happens if the input is something slightly more complex? Consider the case of the input being TWO sinusoids:

$$V_{in} = C\sin(2\pi F_1(t)) + D\sin(2\pi F_2(t))$$

These have amplitudes C and D and frequencies (in Hz) of F1 and F2. If you plug this in for  $V_{in}$  in the second term, you get the desired action - components at frequencies F1 and F2, scaled by the gain B. But if you plug THIS  $V_{in}$  into the first (squared) term, you get out some nasty results:

- Components at twice each frequency; these are the "harmonics" of the original signals. PLUS, you get
- Components at the sum and difference frequencies, resulting from the term  $2CD\sin(2\pi F_1(t))\sin(2\pi F_2(t))$ . THESE are what result in what appear to be "sidebands" in the spectrum, and are also what makes AM work (if this were supposed to be an AM modulator, that is). Hence the term "intermodulation", or "intermod."

Actually, the latter set of frequencies is more often a problem than the harmonics; 2X the original frequency is usually far enough removed from the desired signal so as to be easily filtered out. But these "sideband-like" products are RIGHT THERE, stuck in and among the components you wanted in the first place. As such, they represent a distortion that is more difficult to get rid of than the simple harmonics.

Bob Myers	KC0EW	Hewlett-Packard Co.	Opinions expressed here are not
		Systems Technology Div.	those of my employer or any other
myers@fc.hp.com		Fort Collins, Colorado	sentient life-form on this planet.

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Date: Wed, 21 Jul 1993 07:14:41 GMT  
From: psinntp!pixar!bruce@uunet.uu.net  
Subject: Popular Electronics advertises perpetual-motion machine.  
To: info-hams@ucsd.edu

If you see the September issue of Popular Electronics (which is on newsstands now) take a look at the inside front cover. It's a full-page ad for the new Mohawk Environmental Services "SWITCH-CHARGER". This amazing device allows a battery to recharge itself while at the same time powering a circuit!

Yes, Popular Electronics published a full-page ad for a perpetual motion device on the inside front cover of their September issue. I haven't read PE regularly since my childhood - I knew they'd been in decline for 20 years, but had no idea they'd gone this low.

The ad goes on to say that you can get the plans for this device for just \$100, check or money order only. Send it to a post office box in Springfield, MA. No phone number is given.

Funniest of all are the blurry pictures of the device: a poorly cropped picture from one angle, a very small picture at another angle, and a low-resolution blow up of the small picture! Two identical images, different sizes. The device appears to consist of a glass of ice cubes on a board with speaker terminals on either side of it. A blurry diagram similar to a bridge rectifier is drawn on a cap on top of the glass of ice cubes.

Now, obviously, PE isn't going to get paid for this ad. It's either straight fraud, in which case the P.O. box is collected from once and the con artist disappears, or it's a malicious joke on PE. In either case it's clear that nobody with even half a brain checks their ads. I'd be embarrassed to be seen with a copy of their magazine after this.

Bruce Perens KD60TD

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Date: 21 Jul 93 10:21:38 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: TS50  
To: info-hams@ucsd.edu

TS-50

Fred, KD4II wrote:

>>Paul-

>>I have buttons 3 and 4 set up to do what you mentioned. Button 3 does  
>>the USB-LSB-CW, and button 4 does the AM-FM.

Great! That's what I want it to do. Better dig out the "menu" tables again! Once you've selected AM-FM for example, can you then select the USB\_LSB\_CW with the other button?

>>This points out one minor problem I've experienced. Sometimes, while  
>>pressing the up-down buttons to change memory channels, one of the  
>>programmed buttons will activate instead.

Haven't seen this yet with mine.

>>With regard to the S-meter calibration, I got into a "discussion" the other  
>>day, about how many dB there were in an S-Unit. Since back in the 50's, I  
>>had always heard that there was no absolute standard, but most receivers  
>>were supposed to be "about 6 dB" per S-Unit.

^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

Since the S-scale is derived from the dbm scale, and most receiver measurements are made in dbm's, it is SUPPOSED to be representative of an absolute value! It SHOULD be, as you said, about 6db/S-unit. Actually, 5.6db is more accurate, but thats not nice and neat 'cause when you divide 50 by nine (9 S-units) it doesn't work out without fractional parts! Converting from the absolute value of S-9 (-73dbm), S9 SHOULD be 50uv.

As Roy, W7EL said in another note, it is difficult to maintain any reasonable accuracy, especially considering the band-to-band gain characteristics of the equipment. But try and tell that to the guy that owns that fancy new XTZ glitz-box that he just paid a zillion dollars for some time! You'll get an earful for sure! And therein lies the rub. Some guys really do think the damn thing is actually reasonably accurate! Or worse yet, they believe that one radio is better than another 'cause of the damn S-meter! They think that one radio is more sensitive for example, based on the S-meter. Good grief!

>>a ten dB pad between the generator and the receiver under test. The final  
>>results were that you just can't trust an S-Meter! I found values ranging  
>>from 1.6 dB, up to 13.2 dB per S-Unit.

Yup! Did you find ANY band where it was even close?

Roy added:(or was it Jack?)

>How may dB correspond to one S unit?

5.6 in absolute terms. Since the scale is referenced to the "standard" dbm values, this is what it SHOULD mean. Everywhere in the world, 0dbm means 1mw across a 50ohm load (223.5mv)! S9 is -73dbm (50uv). S1 is -123dbm. Notice the difference between S1 and S9 is 50db, or 5.6 per S-unit, in round numbers.

>Is there a uniform well defined standard?

Yes; but in practice, no. The problem I have with them is that an S-meter kinda "masquerades" as an indicator of some real, meaningful information! And some among us actually think they do! There's nothing at all "uniform" about them, altho' they may make the scale look kinda uniform most of the

>tnx es 73 de k9cun (Jack Derry)

There really is, but no one cares enough to make them accurate, as you suggest below.

This is how it's actually done. If it were not for the very wide gain variations band-to-band, this wouldn't be so difficult to do! Some of the very best available amateur equipment has as much as 35db difference in gain from one band to another, and thats where the difficulty doing this comes from. It should be easy, but the gain variations make it much more difficult.

??? Don't they tell us that the AGC characteristic results in some small value of increase in output, for such-and-such a change in input! If they can keep the output within 2-3db, when the input changes over 100db, it sure sounds to me like they know how to do it! And we EXPECT the AGC to do this for us so we don't have to ride herd on the volume control as we tune up and down the band. That's what AGC is supposed to do! If they can keep the output in that range, why can't they make an S-meter just as accurate?! The answer is, they can. Imagine an S-meter that was as accurate. Two or three db worth of error, spread across 9 S-units would make them actually meaningful. Wouldn't that be different?

>>so manufacturers of amateur equipment don't have any incentive to do so.

Right! We, collectively have never asked them to make it right, so they don't bother. Thats different than saying its too hard to do, 'cause its not.

>>doesn't sell rigs, so it isn't done. (I'm told but haven't verified that  
^^^^^^^^^^^^^^^^^^^^

Now you're talkin!

>>old Collins rigs had not only a consistently sized S-unit, but a calibrated  
^^

>>signal strength for S9. Neither of these is so for modern rigs.)  
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

Well, the alignment procedure actually specifies injecting 50uv (the right level) at 14.2Mhz, and setting the IF GAIN for S9! Notice GAIN! I have no idea how they held, band-to-band, but I always felt that the signals indicated made more sense than the present day gear.

Consider this example: A guy you're working is running 100 watts, and his signal is S9 on your xyz-glitz box. He kicks in an amp at 1kw, and now your s-meter says S9+20! He feels real good when you tell him, but then you ask did he say 10kw? And he feels even better! Everyone feels real, real good. Now you know why they won't make'em read right! Its the bean counters at work; marketing! Like you said, it doesn't sell rigs!

<<lots deleted for this response, good stuff tho'>>

>>Please, please don't quote gains in S-units. Gain in "potatoes" would be  
>>as meaningful and less misleading.

It is pretty silly isn't it! What's even worse is that it doesn't have to be this way. Not today anyway. They could make'em right.

>>Roy Lewallen  
>>W7EL

Just think, you could tell that loud-mouth down the band on 75 that he only went up 8-10db when he kicked on his louden-boomer! He'd get real mad, tell you your receiver was broke, and then his buddy would tell him it was true! He'd go away, and tear his amp apart looking for the problem, and you wouldn't have him bothering you for a few nights!

Well, we can always dream, right?

73's  
Paul  
WB20YC  
ar..

-----  
Date: 21 Jul 1993 03:40:53 -0400  
From: digex.com!digex.net!not-for-mail@uunet.uu.net  
To: info-hams@ucsd.edu

References <1993Jul19.110351.28366@ennews.eas.asu.edu>,  
<CAEyrM.8F5@murdoch.acc.Virginia.EDU>, <22gnqi\$25u@gopher.cs.uofs.edu>p  
Subject : Re: Order pizza on your autopatch now

bill@cs.uofs.edu (Bill Gunshannon) writes:  
>Does anyone have a complete copy of the FCC release?? It was said that  
>this change would also allow the use of Amateur Radio more in support of  
>education. Was this included?

Yes.

For those amateurs who don't know how to contact  
the governmental body charged with regulating  
amateur radio:

"The amendment [allows] licensees to use  
amateur service frequencies to ... support  
educational activities..."

Listen to Westlink, they're sure to discuss it  
in as much details as warranted. More detail  
available from the Federal Communications Commission.

That is all.

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bote@access.digex.net (John Boteler)  
WARNING: You are subject to pre-emption!

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End of Info-Hams Digest V93 #884  
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